Contents

Section 11

Southeast Colorado River Basin

Utah State Water Plan

Drinking Water

11.1 INTRODUCTION

This section of the Southeast Colorado River Basin Plan provides information and data on the treatment, distribution and regulation of public drinking water supplies. Information and data are also presented on organizations, regulations and problems associated with the development and distribution of drinking water for public systems.

11.2 SETTING

There are 53 public water systems within the Southeast Colorado River Basin, 14 in Grand County and 38 in San Juan County. These include 20 public community systems and 24 public non-community systems regulated by the Utah Division of Drinking Water (DDW) and 9 "Other Navajo Indian Community" systems regulated by the Navajo Nation Public Water System Supervision Program (PWSSP).

Blanding municipal reservoir

There are 4 community and 10 non-community systems in Grand County. San Juan County has 16 community and 14 non-community systems of which 9 community systems (2 San Juan School District and 7 Navajo Tribal Utility Authority) and one non-community system (Goulding Trading Post & Lodge) are located within the Navajo Indian Reservation and one community system is operated by the Ute Mountain Ute Tribe at White Mesa. The public community water systems are shown in Table 11-1 and on Figure 11-1. The public non-community water systems appear in Table 11-2.

High quality water quenches thirst, is necessary for most household tasks and helps provide a quality life.

The DDW monitors systems under their responsibility to assure that public community and public non-community drinking water adheres to state and federal regulations. The Navajo Tribal Utility Authority (NTUA) and the Navajo Nation PWSSP regulate and operate the public community systems on the reservation. All of these systems are monitored to meet the requirements of the federal Safe Drinking Water Act.

Three of the public community systems, Blanding, Halchita/ Mexican Hat and Monticello are supplied by surface water treatment plants. Four communities rely all or partly on springs and the other communities use wells. About 79 percent of the culinary water supply comes from groundwater and about 21 percent comes from surface water. All of the individual domestic systems get water from private wells.

Table 11-1
PUBLIC COMMUNITY SYSTEMS WATER USE - 1996[14,15]

Water System	Regulated By[a]	Residential (ac-ft)	Commercial (ac-ft)	Institutional (ac-ft)	Industrial (ac-ft)	Total M&I (ac-ft)	People Served	Per Capita Use (g/cd)
GRAND COUNTY								
Day Star Adventist Academy	DDW	4	0	1	0	5	37	121
Grand Water & Sewer Service Agency	DDW	511	39	11	0	561	2,238	224
Moab City	DDW	1,017	382	149	0	1,548	5,000	276
Thompson Water Improvement District	DDW	19	24	6	0	49	70	625
Grand County Total		**1,551**	**445**	**167**	**0**	**2,163**	**7,345**	**263**
SAN JUAN COUNTY								
Blanding City Public Works Department	DDW	637	71	4	1	752	3,299	203
Eastland Special Service District	DDW	5	0	0	0	5	60	74
Hall's Crossing Marina (NPS)	DDW	46	18	32	1	97	330	262
Monticello Municipal Water System	DDW	315	19	11	2	347	2,100	148
Monument Valley H.S. (SJ School Dist)	DDW	13	0	32	0	45	60	670
Navajo Mtn H.S. (San Juan School Dist)	DDW	2	0	2	0	4	50	71
San Juan Service Area #1 (Bluff)	DDW	22	29	10	0	61	300	182
San Juan Co SSD #1 (Mexican Hat)	DDW	2	30	1	0	33	110	268
White Mesa (Ute Mountain Ute Tribe)	DDW	29	0	0	0	29	325	80
San Juan County Subtotal		**1,071**	**167**	**92**	**4**	**1,334**	**6,634**	**180**
Navajo Tribal Utility Authority (NTUA)								
Aneth Community	DDW, PWSSP	24	5	0	29	51	370	123
Holly Village Community	DDW, PWSSP	3	0	0	0	3	60	45
Mexican Hat/Halchita Community	DDW, PWSSP	13	5	13	0	31	320	86

Table 11-1 PUBLIC COMMUNITY SYSTEMS WATER USE - 1996 (continued)

Water System	Regulated By [a]	Residential (ac-ft)	Commercial (ac-ft)	Institutional (ac-ft)	Industrial (ac-ft)	Total M&I (ac-ft)	People Served	Per Capita Use (g/cd)
Montezuma Creek Community	DDW, PWSSP	15	3	25	4	47	240	175
Oljato Community	DDW, PWSSP	21	2	0	0	23	300	68
Red Mesa Community	DDW, PWSSP	11	0	1	0	12	240	45
Todohaidekani Community	DDW, PWSSP	8	0	0	0	8	120	60
Navajo Tribal Utility Authority Total		**95**	**15**	**39**	**33**	**182**	**1,650**	**98**
Other Navajo Indian Community Water Systems								
Aneth Boarding School (BIA)	PWSSP	50	0	0	0	50	300	149 [b]
Goulding Trading Post & Lodge [c]	DDW, PWSSP	[44]	[82]	[0]	[0]	[126]	[300]	[375]
Monument Valley Mission/Hospital [d]	PWSSP	[10]	[0]	[17]	[0]	[27]	[190]	[127]
Monument Valley Tribal Park	PWSSP	27	0	0	0	27	250	95 [e]
Navajo Mountain Boarding School (BIA)	PWSSP	8	0	12	0	20	50	357
Navajo Mountain Chapter House	PWSSP	8	0	0	0	8	75	95
Navajo Mountain Health Clinic	PWSSP	8	0	0	0	8	50 [f]	143 [b]
Rainbow Village	PWSSP	27	0	0	0	27	255	95
Shonto Chapter House	PWSSP	16	0	0	0	16	150 [f]	95 [e]
Other Navajo Indian Community Systems Total [g]		**144**	**0**	**12**	**0**	**156**	**1,130**	**123**
Navajo Nation Community Systems Total [g]		**239**	**15**	**51**	**33**	**338**	**2,780**	**109**
San Juan County Total [g]		**1,310**	**182**	**143**	**37**	**1,672**	**9,414**	**159**
BASIN TOTAL [g]		**2,861**	**627**	**310**	**37**	**3,835**	**16,759**	**204**

[a] DDW - Utah Division of Drinking Water; PWSSP - Navajo Nation Public Water System Supervision Program.
[b] Average of Aneth and Montezuma Creek NTUA community systems.
[c] Trading post is considered a public non-community system by the Utah Division of Drinking Water (See Table 11-2) and public community system by the Navajo Nation. It also supplies water to Monument Valley Mission /Hospital. Public community system totals do not include this system.
[d] Served by wells at Goulding Trading Post and Lodge.
[e] Average of NTUA community systems gallons per capita day.
[f] Estimated population served.
[g] Totals do not include Goulding Trading Post and Lodge and Monument Valley Mission/Hospital.
Note: Data based on a local study for the City of Moab and Grand Water and Sewer Service Agency are given in Section 11.6.

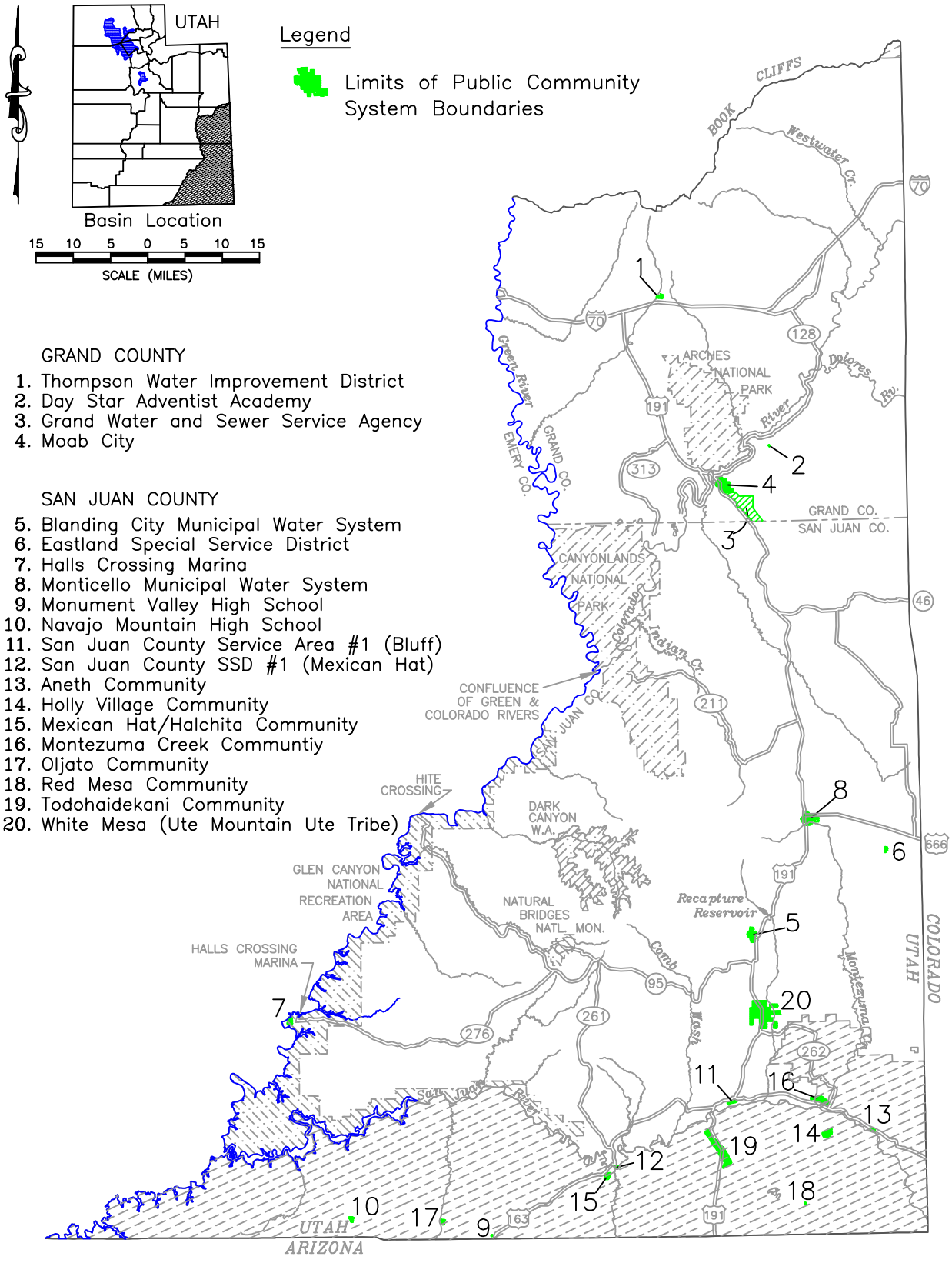


Figure 11–1
PUBLIC COMMUNITY SYSTEMS BOUNDARIES
Southeast Colorado River Basin

Table 11-2
PUBLIC NON-COMMUNITY SYSTEMS WATER USE - 1996[14,15]

System Name	Regulated By[a]	Residential (ac-ft)	Commercial (ac-ft)	Institutional (ac-ft)	Total (ac-ft)
Grand County					
Forest Service, Warner Campground & Guard Station	DDW	0.0	0.0	0.4	0.4
National Park Service					
Arches National Park, Headquarters	DDW	3.0	0.0	6.7	9.7
Arches National Park, Devils Garden	DDW	0.0	0.0	1.9	1.9
State Parks & Recreation, Dead Horse Point State Park	DDW	0.6	0.0	1.6	2.2
Other Systems					
Bucks Grill House	DDW	1.0	1.0	0.0	2.0
Canyonlands Field	DDW	1.0	1.0	0.0	2.0
Grand County Lions Park	DDW	0.0	0.0	3.0	3.0
Matrimony Spring	DDW	0.0	0.0	0.3	0.3
Moab KOA Campground	DDW	0.0	4.0	0.0	4.0
Slickrock Campground	DDW	0.0	11.8	0.0	11.8
Grand County Total		**5.6**	**17.8**	**13.9**	**37.3**
San Juan County					
Forest Service					
Buckboard Campground	DDW	0.0	0.0	0.1	0.1
Dalton Springs Campground	DDW	0.0	0.0	0.1	0.1
Devils Canyon Campground	DDW	0.0	0.0	0.3	0.3
Nizhoni Campground	DDW	0.0	0.0	0.2	0.2
National Park Service					
Canyonlands National Park, Island in the Sky	DDW	0.3	0.0	0.6	0.9
Canyonlands National Park, Needles District	DDW	0.9	0.0	2.6	3.5
Glen Canyon Recreation Area, Dangling Rope Marina	DDW	1.6	4.2	1.0	6.8
Hovenweep National Monument	DDW	0.4	0.0	0.9	1.3
Natural Bridges National Monument	DDW	0.4	1.9	0.0	2.3
Bureau of Land Management, Wind Whistle Campground	DDW	0.0	0.0	0.1	0.1
Other Systems					
Kane Springs Highway Rest Stop	DDW	0.0	0.0	2.5	2.5
Montezuma Trailer Park	DDW, PWSSP	0.0	0.5	0.0	0.5
Goulding Trading Post Lodge/Monument Valley Hospital[b]	DDW, PWSSP	53.4	82.2	17.0	152.6
Pack Creek Ranch	DDW	0.0	3.0	0.0	3.0
San Juan County Total w/0 Goulding Trading Post		**[3.6]**	**[9.6]**	**[8.4]**	**[21.6]**
Basin Total w/o Goulding Trading Post		**[9.2]**	**[27.4]**	**[22.3]**	**[58.9]**
San Juan County Total		**57.0**	**91.8**	**25.4**	**174.2**
Basin Total		**62.6**	**109.6**	**39.3**	**211.5**

[a] DDW - Utah Division of Drinking Water; PWSSP - Navajo Nation Public Water System Supervision Program.
[b] This system is also listed in Table 11-1 under "Other Navajo Indian Community Water Systems."

11.3 ORGANIZATION AND REGULATIONS

Federal regulations, state rules and local government requirements are enforced and/or administered by a number of public agencies to ensure that the general public is provided with a safe and reliable source of drinking water.

11.3.1 Local Facility Owners and Operators

Owners and operators of individual treatment and distribution systems are directly responsible for the quality of water delivered to the public within their respective service areas. The day-to-day operation of drinking water treatment facilities must be done in a manner that assures compliance with state rules and federal regulations for drinking water (See Section 7).

Currently, there are three plants that treat local surface water sources to bring them up to culinary drinking water standards. The Blanding, Halchita/Mexican Hat and Monticello treatment plants divert water from Johnson/Indian Creek, the San Juan River and Blue Mountain Springs/Loyd's Lake, respectively. These treatment plants are described in Table 11-3.

Blanding water treatment plant

Utah regulated public water systems that, for any reason, pose a threat to public health must be reported to the Utah Division of Drinking Water. Follow-up evaluations are used to revise system operational policies to minimize the likelihood of similar situations in the future. Sanitary surveys are conducted every three years to allow state and local health authorities to grade each public water system. The Navajo Nation Environmental Protection Agency carries out these functions on the reservation.

Table 11-3
WATER TREATMENT PLANTS

Name	Capacity (mgd)	Storage (No./1,000 gal)	Treatment
Blanding	2.6[a]	1/1,000[b]	Flocculation, sedimentation, filtration, disinfection
Halchita	0.125	2/200	Pre-sedimentation, flocculation, chlorination, fluoridation
Monticello	1.4	2/1,250	Turbidity, disinfection

[a] Capacity has been increased with polymer flocculating agent.
[b] Treated water discharges into a 100,000-gallon clear well and then flows by gravity to the storage tank.

11.3.2 State Drinking Water Regulations and Programs

Title 19, Chapter 4, of the Utah Code Annotated is referred to as the Utah Safe Drinking Water Act (USDWA). The Act created a Drinking Water Board with power and authority to regulate and protect the quality of all public drinking water supplies in the State. The USDWA authorized the Drinking Water Board (DWB) to: 1) Establish standards for drinking water quality; 2) establish standards and regulations for the design and construction of new and expanded water treatment and conveyance facilities; 3) protect watersheds and other sources of raw public water supplies; 4) provide technical and financial assistance to local water provider agencies to promote clean water programs, train treatment plant and/or system operators, construct new treatment and distribution facilities to meet expanding drinking water demands, and/or renovate existing treatment and distribution facilities to improve existing treatment processes; 5) administer federal programs that provide technical and financial assistance to local water provider agencies; 6) implement emergency plans in the event of natural disasters resulting in the contamination of public drinking water supplies; and 7) provide enforcement of both state rules and federal drinking water regulations.

The DDW acts as the administrative staff for the Drinking Water Board. In general, state drinking water regulations are consistent with comparable federal regulations. State regulations can be more stringent than federal regulations if the DWB and DDW feel federal regulations do not adequately protect the health and well-being of the state's populace.

Public drinking water systems are categorized as "community;" "non-transient, non-community;" and "non-community" systems. "Community" water systems are those which serve a minimum of 15 connections or regularly serve 25 or more residents on a year-round basis. "Non-transient, non-community" systems regularly serve at least 25 of the same persons over six months of the year. "Non-community" systems are typically individual wells that provide water to fewer than 15 connections for residential, commercial and/or industrial water uses.

The DDW takes an active role in promoting the quality and quantity of drinking water supplies. As an example, they: 1) Preview and approve engineering plans for proposed drinking water system modifications; 2) administer loan programs for drinking water projects; 3) conduct regular inspections of drinking water systems; 4) maintain a rating system for existing facilities; 5) issue administrative orders to noncomplying systems; 6) issue variances and exemptions when federal rules are inappropriate; and 7) administer a source protection program to safeguard the state's drinking water sources.

Aneth water tank

11.3.3 Navajo Nation Drinking Water Systems

There are 16 Navajo Indian public water systems located on the reservation. These are monitored by the Navajo Nation Environmental Protection Agency, Public Water System Supervision Program. Seven of these are operated by the Navajo Tribal Utility Authority and are also regulated by the Utah Division of Drinking Water. These systems are all monitored to assure they are in compliance with the federal Safe Drinking

Water Act. Refer to Table 11-1 for more information.

The Navajo Indian Health Service, Office of Environmental Health and Engineering is responsible for water projects to improve existing drinking water systems or to install new facilities. They currently have eight active projects and three more in various stages of planning.

11.3.4 Federal Drinking Water Programs

With the passage of the federal Safe Drinking Water Act (SDWA) in 1974, the federal government established national drinking water regulations to protect the public from water borne disease. Congress expanded and strengthened the SDWA in 1986 and 1996. These amendments significantly increased the responsibility of the federal Environmental Protection Agency (EPA), Division of Drinking Water, and local provider agencies. These responsibilities now:

- set the establishment of maximum levels of contamination for all regulated pollutants;
- set compliance deadlines for owners/operators of treatment facilities in violation of federal regulations;
- regulate surface water treatment associated with lead removal and wellhead disinfection;
- strengthen the enforcement of all regulations in the initial act;
- create federal funding for state revolving loans;
- require all community water systems to have certified operators by the planning year 2001;
- require the operators of all public water systems to publish annual consumer confidence reports;
- include the authority to examine the financial, technical, and managerial capabilities of water systems.

Chemical, physical, radiological, and bacteriological substances in drinking water which pose a health risk to the public are regulated by the EPA under provisions given in the SDWA. The EPA has established an extensive list of maximum contaminant levels (MCL's) for most common organic and inorganic contaminants.

"Primary" MCLs have been established for a number of chemical and biological contaminants. These primary standards are designed to establish treatment requirements to protect public health and safety.

To control and improve the aesthetic quality of drinking water supplies, the SDWA also includes a list of secondary maximum contaminant levels (SMCLs) for water aesthetics such as taste, odor and color. Although the evaluation of these qualities is subjective, the measurement of SMCL's has allowed for a reasonable level of consistency in water aesthetics from one system to another.

The SDWA also requires state and local water provider agencies to monitor a specified list of both regulated and unregulated contaminants. The selection of contaminants is dependent on the number of people served, the water source and contaminants likely to be found. The standardized monitoring frame-work is administered over three, three-year compliance cycles for a nine-year total monitoring period beginning in 1992. The completion of the first nine-year monitoring period will be followed by a second nine-year period.

The 1986 Amendments to the SDWA require all states to develop wellhead protection programs. The DDW has created the Drinking Water Source Protection Rule (DWSPR) which outlines the general requirements to protect wellheads from outside surface contamination. Requirements of the DWSPR include the preparation of a

Drinking Water Source Protection Plan for each groundwater source and providing proof of ownership and maintenance of all land in and around wellheads where surface water contamination may occur.

The Safe Drinking Water Act Amendments of 1996 effectively created the first federally funded state revolving loan fund (SRLF) for construction of drinking water infrastructure. The amendment authorized a total of nearly $10.0 billion of funding for drinking water projects on a national level. The funds are to be spent by planning year 2003. These funds will provide relief for many financially challenged systems in need of federal assistance to comply with SDWA and related regulations. The EPA must offer to enter into agreements with eligible states to allocate grants to capitalize on SRLF programs. Utah has identified a current need for over $66.9 million for drinking water improvement projects.

The (DDW) anticipates having between $6 million and $6.6 million annually through the year 2003 for project funding (See Section 7.5). The state is expected to provide an additional 20 percent of each appropriation as matching cost-share funds. In addition to the project funds, the Drinking Water Board expects to have a portion of its federal appropriations available for regional water system planning.

The SRLF can only be used for health protection associated with community and non-profit non-community water systems. Financial assistance may be used by a public water system only to cover expenditures (not including monitoring, operation, and maintenance) of a type or category that will facilitate compliance with National Primary Drinking Water Regulations (NPDWR) applicable to the system or to otherwise significantly further the health protection objectives of the SDWA.

SRLF recipients must have a viable system. Prior to providing assistance to a public water system that is in significant noncompliance with any requirement of an NPDWR or variance, the DDW must conduct a review to determine whether the intended project will provide the technical, managerial, and financial capability to ensure compliance with the requirements of the updated SDWA.

Intended use plans are also required to qualify for SRLF assistance. Each state that has entered into a capitalization agreement is required to annually prepare a plan that identifies the intended uses of the amounts available to the SRLF. This plan is known as the intended use plan (IUP). When preparing an IUP, states must provide public notice as well as an opportunity for public comment.

The IUP must include: 1) A list of projects to be assisted in the first fiscal year that begins after the date of the plan (including a description of the project); 2) expected terms of financial assistance, and the size of the community served); 3) criteria and methods established for the distribution of funds; and, 4) a description of the financial status of the state loan fund and the short-term and long-term goals of the state loan fund.

Indian tribes also may qualify for SRLF assistance. The EPA may use up to 1.5 percent of the amounts appropriated annually to make grants to Indian tribes that have not otherwise received either grants from the EPA or assistance from other state loan funds. These grants may only be used for expenditures by tribes for public water systems.

11.4 CURRENT AND PROJECTED DRINKING WATER DEMAND

The 1996 drinking water use was 5,570 acre-feet. This includes 3,870 acre-feet public community, 210 acre-feet public non-community and 1,490 acre-feet domestic uses. With a 1996 basin population of approximately 21,827, the average per capita water use was about 228 gallons per capita per day (gpcd). Grand County use was about

319 gpcd and San Juan County use was about 168 gpcd. With a projected population of 39,447 by the planning year 2020 and with no allowance for water conservation, drinking water demand is projected to be 11,140 acre-feet per year and will be 27,980 acre-feet by 2050 with a population of 90,070. See Table 9-2 for more detailed information. The current supply and projected demand are shown in Table 11-4 and Table 11-5.

These projections may be skewed when the non-resident tourist population is taken into account, particularly in Moab. During the peak of the tourist season, the transient population is larger than the number of permanent residents.

The current culinary water demand of 132 gpcd by the Navajo Nation including Goulding Trading Post is less than the 185 gpcd for the balance of San Juan County. In order to put the projected demands on and off the Navajo Indian Reservation in perspective, data for the Navajo Nation is summarized below. The total culinary water use in 1996 was about 484 acre-feet annually serving an estimated population of 3,270 people. Future demands will increase based on recommendations by the Navajo Nation Department of Water Resources, Water Management Branch. These recommended projections are 2.48 percent population growth rate with a demand of 160 gpcd. This will increase the demand to 1,053 acre-feet by 2020 with an estimated population of 5,885 people. By 2050, the demand will be about 2,198 acre-feet for 12,275 people. This data only includes those served by water systems now in place. New systems installed in additional communities will increase the projected demands. See Tables 11-4 and 11-5.

11.5 DRINKING WATER PROBLEMS

The population growth throughout the basin is increasing the demand for water supplies in many communities (Tables 11-4 and 11-5). Perhaps the more acute problems exist with providing the Indians culinary water. Many of the small and isolated Navajo Nation communities have no drinking water distribution systems. A significant number of homes require weekly, and in some cases daily, deliveries of water from tanker trucks to fill small personal jugs and/or containers.

The ability of the public community systems to deliver water is shown in Table 11-6. Moab has the largest delivery deficit by 2020 amounting to nearly 1,200 acre-feet. Five other communities also have delivery deficits. The ability of some Navajo Nation systems to meet future demands is not known. See Table 11-6.

All of the residents of the Town of Castle Valley currently obtain their culinary water from individual wells. They also use septic tanks for waste disposal. With the accelerated growth in the community, there could be a shortage of groundwater to meet the future demand. There could also be contamination from the increased use of septic tanks.

11.5.1 Treatment Plants at Blanding and Mexican Hat

Blanding and Mexican Hat (Halchita) use surface water treatment plants. These communities have come to a point where major system upgrades are necessary to meet the growing local demand. As a result, the city of Blanding has made application for state funding to enlarge and update its existing water treatment and distribution facilities. Mexican Hat has applied for assistance to build a culinary water treatment plant to provide better quality water supplies. They are also considering building capacity to supply the Navajo Nation community of Halchita.

11.5.2 Water Distribution Within Indian Reservations

The Navajo Indian Reservation covers all of the area south and some of the area north

Table 11-4
PUBLIC COMMUNITY SYSTEMS WATER SUPPLY AND DEMAND

Water Supplier	Total Population 1996	2020	2050	Water Supply (ac-ft)	Demand 1996 (acre-feet)	Sur/Def [a] 1996 (acre-feet)	Demand 2020 (acre-feet)	Sur/Def 2020 (acre-feet)	Demand 2050 (acre-feet)	Sur/Def 2050 (acre-feet)
Grand County										
Day Star Adventist Academy	37	50	50	130	5	+125	7	+123	7	+123
Grand Water & Sewer Service Agency[b]	2,238	5,532	16,419	3,620	561	+3,059	1,387	+2,233	4,117	-497
Moab City[b]	5,000	12,360	36,684	6,386	1,548	+4,838	3,827	+2,559	11,359	-4,973
Thompson Water Improvement Dist	70	173	513	137	49	+88	121	+16	359	-222
Grand County Total	**7,345**	**18,156**	**53,666**	**10,273**	**2,163**	**+8,110**	**5,342**	**+4,931**	**15,842**	**-5,569**
San Juan County										
Blanding City Public Works Dept	3,299	4,483	6,464	2,912	752	+2,160	1,022	+1,890	1,474	+1,438
Eastland Special Service District	60	82	118	61	5	+56	7	+54	10	+51
Hall's Crossing Marina (NPS)	330	448	646	211	97	+114	132	+79	190	+21
Monticello Municipal Water System	2,100	2,854	4,115	1,372	347	+1,025	472	+900	681	+691
Monument Valley High School	60	88	133	168	45	+123	66	+102	100	+68
Navajo Mountain High School	50	73	111	10	4	+6	6	+4	9	+1
San Juan Co Ser Area #1 (Bluff)	300	408	588	177	61	+116	83	+94	120	+57
San Juan Co SSD #1 (Mexican Hat)	110	149	215	92	33	+59	43	+49	62	+30
White Mesa (Ute Mtn Ute Tribe)	325	442	637	77	29	+48	39	+38	56	+21
San Juan County Subtotal	**6,634**	**9,027**	**13,027**	**5,080**	**1,373**	**+3,707**	**1,870**	**+3,210**	**2,702**	**+2,378**

Table 11-4 (continued)
PUBLIC COMMUNITY SYSTEMS WATER SUPPLY AND DEMAND

Water Supplier	Total Population 1996	2020	2050	Water Supply (ac-ft)	Demand 1996 (acre-feet)	Sur/Def [a] 1996 (acre-feet)	Demand 2020 (acre-feet)	Sur/Def 2020 (acre-feet)	Demand 2050 (acre-feet)	Sur/Def 2050 (acre-feet)
Navajo Nation - NTUA										
Aneth Community	370	540	815	144	51	+93	74	+70	112	+32
Holly Village Community	60	88	133	69	3	+66	4	+65	6	+63
Mexican Hat/Halchita Community	320	467	705	226	31	+195	45	+181	68	+158
Montezuma Creek Community	240	350	528	1,612	47	+1,565	69	+1,543	104	+1,508
Oljato Community	300	438	661	95	23	+72	34	+61	51	+44
Red Mesa Community	240	350	528	190	12	+178	18	+172	27	+163
Todohaidekani Community	120	175	264	121	8	+113	12	+109	18	+103
Navajo Nation - NTUA Total	**1,650**	**2,408**	**3,634**	**2,457**	**175**	**+2,282**	**256**	**+2,201**	**386**	**+2,071**
San Juan County Total	**8,284**	**11,435**	**16,661**	**7,537**	**1,547**	**+5,990**	**2,126**	**+5,411**	**3,088**	**+4,449**
Basin Total	**15,629**	**29,591**	**70,327**	**17,810**	**3,711**	**+14,100**	**7,468**	**+10,342**	**18,930**	**-1,120**

[a] Sur/Def - Surplus or + and deficit or - for the projected time period.
[b] Data based on a local study for the City of Moab and Grand Water and Sewer Service Agency are given in Section 11.6.
Note: The population projections for the Navajo Nation communities are based on data provided by the Governor's Office of Planning and Budget. The water demand projections are based on 1996 use rates and projected populations.

Table 11-5
NAVAJO NATION COMMUNITY SYSTEMS WATER SUPPLY AND DEMAND[a]

Water Supplier	Total Population 1996	2020	2050	Water Supply (ac-ft)	Demand Sur/Def 1996 (acre-feet)		Demand Sur/Def 2020 (acre-feet)		Demand Sur/Def 2050 (acre-feet)	
Navajo Tribal Utility Authority (NTUA) Community Systems										
Aneth Community	370	666	1,389	144	51	+93	119	+25	249	-105
Holly Village Community	60	108	225	69	3	+66	19	+50	40	+29
Mexican Hat/Halchita	320	576	1,201	226	31	+195	103	+123	215	+11
Montezuma Creek Community	240	432	901	1,612	47	+1,565	77	+1,535	161	+1,451
Oljato Community	300	540	1,126	95	23	+72	97	-2	202	-107
Red Mesa Community	240	432	901	190	12	+178	77	+113	161	+29
Todohaidekani Community	120	216	450	121	8	+113	39	+82	81	+40
NTUA Community Systems Total	**1,650**	**2,970**	**6,193**	**2,457**	**175**	**+2,282**	**531**	**+1,926**	**1,109**	**+1,348**
Other Navajo Nation Community Systems										
Aneth Boarding School (BIA)	300	540	1,126	100E	50	+50	97	+3	202	-102
Goulding Trading Post & Lodge	300	540	1,126	153	126	+27	97	+56	202	-49
Monument Valley Mission/Hospital[b]	190	340	710	27	27	0	61	-44	127	-110
Monument Valley Tribal Park	250	450	940	50E	27	+23	81	-3	168	-118
Navajo Mountain Boarding School (BIA)	50	90	190	20	20	0	16	+4	34	-14
Navajo Mountain Chapter House	75	135	280	8	8	0	24	-16	50	-42
Navajo Mountain Health Clinic	50	90	190	20	8	+12	16	+4	34	-14
Rainbow Village	255	460	960	47	27	+20	82	-35	172	-125
Shonto Chapter House	150	270	560	30E	16	+14	48	-18	100	-70
Other Navajo Nation Community Systems	**1,620**	**2,915**	**6,082**	**455**	**309**	**+146**	**522**	**-49**	**1,089**	**-644**
Navajo Nation Community Systems Total	**3,270**	**5,885**	**12,275**	**2,912**	**484**	**+2,428**	**1,053**	**+1,877**	**2,198**	**+704**

[a] The population and water use for 1996 are data from the Utah Division of Water Resources and the Navajo Nation based on current per capita use rates. The projected demand and population are based on 160 gpcd and a growth rate of 2.48 percent used by the Navajo Nation Water Management Branch. Some of the data are estimated for "Other Navajo Nation Community Systems." Data includes Goulding Trading Post wells.

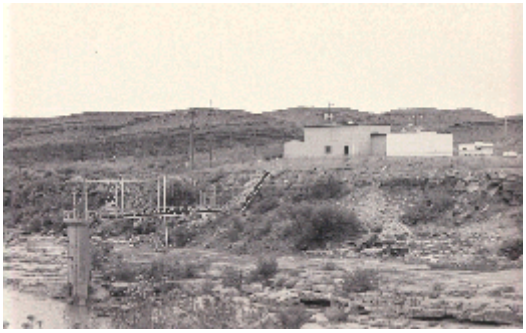
[b] This community is supplied water by the Goulding Trading Post & Lodge wells.

E - Estimated.

Table 11-6
PUBLIC COMMUNITY SYSTEMS CAPACITY[14]

Water Supplier	Total M&I Use 1996 (acre-feet)	Total M&I Use 2020 (acre-feet)	Water Supply (ac-ft)	System Capacity (ac-ft)	Surplus[a] Deficit 2020 (ac-ft)
Grand County					
Day Star Adventist Academy	5	12	130	NA	NA
Grand Co WCD/Sp Valley W&SD	561	1,387	3,620	1,588	+2 01
Moab City	1,548	3,827	6,386	2,669	-1,158
Thompson Water Impr Dist	49	121	137	57	-64
San Juan County					
Blanding City Pub Wks Dept	752	1,022	2,912	1,290	+268
Eastland Spec Service Dist	5	7	61	33	-26
Halls Crossing Marina (NPS)	97	132	211	97	-35
Monticello Municipal Water System	347	472	1,372	634	+162
Monument Valley High School	45	66	168	NA	NA
Navajo Mountain H.S. S.J. School District	4	6	10		
San Juan County Service Area #1(Bluff)	61	83	177	80	-3
San Juan Co SSD#1 (Mexican Hat)	33	43	92	40	-3
White Mesa (Ute Mountain Ute Tribe)	29	39	77	41	+2
Navajo Tribal Utility Authority					
Aneth Community	51	71	144	69	-2
Holly Village Community	3	4	69	NA	NA
Mexican Hat/Halchita Comm	31	45	226	118	+73
Montezuma Creek Community	47	69	1,612	727	+658
Oljato Community	23	34	95	NA	NA
Red Mesa Community	12	18	190	NA	NA
Todohaidekani Community	8	12	121	NA	NA

[a]The system capacity is always limiting in ability to meet demands. The surplus or deficit is the ability to deliver the 2020 population demand.
Source: Municipal and Industrial Water Supply Studies by the Division of Water Resources.



Halchita water treatment plant

and east of the San Juan River in the southern-most portion of San Juan County. It includes part of seven chapters and all of one (Aneth) chapter within Utah. Each chapter contains a number of small isolated communities and individual homes. Culinary water systems within the Navajo Nation typically consist of individual wells, small pump stations and distribution systems at the main communities in each chapter. These systems are shown on Figure 11-2. Outlying communities and individual homes usually do not have wells or distribution systems so water is trucked to these areas for domestic use. This method of water distribution does not meet the needs of these people.

The problems associated with constructing a reliable and safe water distribution system for these outlying Indian communities should be investigated cooperatively by both the Bureau of Indian Affairs and the Division of Drinking Water. In addition, the Navajo Department of Water Resources, Navajo Tribe Utilities Authority and Indian Health Service should be involved. Other agencies with technical expertise or financial resources include the federal Environmental Protection Agency, Bureau of Reclamation and U.S. Department of Agriculture.

11.6 ALTERNATIVES

There are several alternatives to provide drinking water supplies for those communities that will be facing future shortages. These alternatives are discussed in the following sections. The final decision to use one of the alternatives presented or another one will be made by the local entity involved.

11.6.1 City of Moab

The City of Moab acquired the rights for one-half of Skakel Spring to serve the original townsite. The City of Moab has now acquired water rights for four additional springs providing a total of 965 acre-feet per year. In addition, they have perfected rights and are proving up the rights for six wells with a total of 8,204 acre-feet per year. This provides a current total of 9,169 acre-feet per year or 7.324 million gallons per day.

The Moab Irrigation Company provides water to shareholders for outside irrigation within the city and for unincorporated areas to the north and west. In 1994, Moab Irrigation Company installed pressurized pipelines to replace the open ditch system within Moab.

Grand County and the City of Moab collaborated in preparing a build-out study in 1994. The study determined the density limit under the current zoning regulations of the land within Moab and the "islands" of unincorporated county areas within the city limits. Subsequent impact fee studies used 305 gallons per capita per day and 2.77 persons per household to determine the build-out population of 18,473.

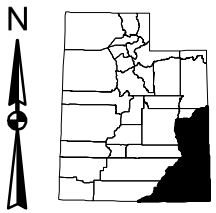
The estimated build-out peak demand is 6.019 million gallons per day, well below the present source capacity of 7.324 million gallons per day. If water is provided to the corridor north of Moab and Arches National Park visitors center and/or the city boundary is expanded, this surplus may disappear.

For the immediate future, construction of an additional 1.0 million gallon storage tank would provide adequate system capacity. Also, additional water could be acquired through purchase of the remaining one-half of Skakel Spring. The continued use of Moab Irrigation Company water for outside irrigation would reduce the demand on the

Figure 11-2

NAVAJO NATION PUBLIC WATER SYSTEMS

Southeast Colorado River Basin



10 0 10 20 Miles

Public Water Systems

NOTE: Systems operated and maintained by the Navajo Tribal Utility Authority

high quality culinary water. There is also groundwater in the bedrock aquifers of the Glen Canyon Group in Spanish Valley that can be developed. The Grand County Regional Drinking Water Facilities Plan contains two recommendations for the City of Moab: 1) Construction of an additional water storage tank, and 2) development of an outside secondary water system.

11.6.2 Grand Water and Sewer Service Agency

Prior to 1999, Spanish Valley Water and Sewer Improvement District retailed water produced by Grand County Water Conservancy District (GCWCD) under a contract that provided for delivery of up to 650 acre-feet per year. This water was obtained by GCWCD through an exchange agreement whereby irrigation quality water produced from the Ken's Lake/Mill Creek Project was exchanged for the use of two culinary quality wells used for irrigation purposes. The exchange provided for the economical development of additional sources of culinary water and the full development of surface water associated with the Mill Creek Project. This arrangement is now included in the recent merger of these entities into the Grand Water and Sewer Service Agency (GWSSA).

If growth in Spanish Valley continues at the present rate, the culinary water demand will soon exceed the current supply of high quality supplies. The (GWSSA) would be short 4,234 acre-feet to meet the demand when full build-out occurs. Rights already exist for 3,582 acre-feet of groundwater and they are planning to obtain 650 acre-feet of surface water from the Colorado River. The Grand County Regional Public Drinking Facilities Plan recommends a study to quantify the amount of high quality groundwater that can be developed in the Glen Canyon Group aquifer. This study is now underway.

11.6.3 City of Blanding

The City of Blanding has developed a culinary water supply that will meet projected demands beyond the year 2050. There is a need to increase the capacity of their water treatment plant and to construct an additional storage tank. Plans are underway to construct these facilities.

11.6.4 Town of Castle Valley

The Town of Castle Valley has a study underway to determine the impact of additional septic tank systems on the existing groundwater supply. The study will also determine how much development can occur within the alluvial aquifer. At some point in time, consideration should also be given to installing a community culinary water system along with a sewerage system to replace the existing individual wells and septic tanks.

11.6.5 Navajo Nation

There is a dire need for additional culinary water development within the Navajo Indian Reservation, not only to meet current needs but for projected demands as well. The Navajo Nation has eight projects that need to be implemented in the near future with planning on an additional three projects. There are an additional 55 projects that have been proposed. Total cost for these projects is estimated at about $26 million. ❑